THE STEREOSCOPE AND STEREOSCOPIC PHOTOGRAPHS

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INTRODUCTION

CERTAINLY no one need to apologize for calling particular attention to articles from the pen of Oliver Wendell Holmes. Indeed, we believe that we shall be doing something for the cause of general education if we are able to secure a wider acquaintance with Dr. Holmes's convictions as to the use and value of *stereoscopic* photographs. Other thinkers might be quoted, but it will be seen from Dr. Holmes's discussion of the question that the stereoscope must have an important part to play in educational work, both in and out of the schools,—a part, the possibilities of which it is by no means so easy to appreciate or determine as has been supposed.

There are three distinct reasons for re-publishing these articles:

(1) To show the utter absurdity of many widespread misconceptions, as, for instance, that stereoscopic photographs are of importance mainly as means for amusement and entertainment rather than for education.

(2) To give an example of intelligent appreciation of stereoscopic views; as well as their possibilities to a person who does appreciate them.

(3) To show, what few people know,—the correct way to use stereoscopic views.

Though always happy in his treatment of a subject, still the wonders and possibilities of the stereoscope impressed Dr. Holmes strongly, and the following articles furnish one of the best examples of delightful expression and keen and prophetic insight.

THE STEREOSCOPE
AND THE
STEREOGRAPH

DEMOCRITUS of Abdera, commonly known as the Laughing Philosopher, probably because he did not consider the study of truth inconsistent with a cheerful countenance, believed and taught that all bodies were continually throwing off certain images like themselves, which subtile emanations, striking on our bodily organs, gave rise to our sensations. Epicurus borrowed the idea from him, and incorporated it into the famous system, of which Lucretius has given us the most popular version. Those who are curious on the matter will find the poet's description at the beginning of his fourth book. Forms, effigies, membranes, or *films*, are the nearest representatives of the terms applied to these effluences. They are perpetually shed from the surfaces of solids, as bark is shed by trees. *Cortex* is, indeed, one of the names applied to them by Lucretius.

These evanescent films may be seen in one of their aspects in any clear, calm sheet of water, in a mirror, in the eye of an animal by one who looks at it in front, but better still by the consciousness behind the eye in the ordinary act of vision. They must be packed like the leaves of a closed book; for suppose a mirror to give an image of an object a mile off, it will give one

at every point less than a mile, though this were subdivided into a million parts. Yet the images will not be the same; for the one taken a mile off will be very small, at half a mile as large again, at a hundred feet fifty times as large, and so on, as long as the mirror can contain the image.

Under the action of light, then, a body makes its superficial aspect potentially present at a distance, becoming appreciable as a shadow or as a picture. But remove the cause,—the body itself,—and the effect is removed. The man beholdeth himself in the glass and goeth his way, and straightway both the mirror and the mirrored forget what manner of man he was. These visible films or membranous *exuviae* of objects, which the old philosophers talked about, have no real existence, separable from their illuminated source, and perish instantly when it is withdrawn.

If a man had handed a metallic speculum to Democritus of Abdera, and told him to look at his face in it while his heart was beating thirty or forty times, promising that one of the films his face was shedding should stick there, so that neither he, nor it, nor anybody should forget what manner of man he was, the Laughing Philosopher would probably have vindicated his claim to his title by an explosion that would have astonished the speaker.

This is just what the Daguerreotype has done. It has fixed the most fleeting of our illusions, that which the apostle and the philosopher and the poet have alike used as the type of instability and unreality. The photo-

graph has completed the triumph by making a sheet of paper reflect images like a mirror and hold them as a picture.

This triumph of human ingenuity is the most audacious, remote, improbable, incredible,—the one that would seem least likely to be regained, if all traces of it were lost, of all the discoveries man has made. It has become such an everyday matter with us, that we forget its miraculous nature, as we forget that of the sun itself, to which we owe the creations of our new art. Yet in all the prophecies of dreaming enthusiasts, in all the random guesses of the future conquests over matter, we do not remember any prediction of such an inconceivable wonder, as our neighbor round the corner, or the proprietor of the small house on wheels, standing on the village common, will furnish any of us for the most painfully slender remuneration. No Century of Inventions includes this among its possibilities. Nothing but the vision of a Laputan, who passed his days in extracting sunbeams out of cucumbers, could have reached such a height of delirium as to rave about the time when a man should paint his miniature by looking at a blank tablet, and a multitudinous wilderness of forest foliage or an endless Babel of roofs and spires stamp itself, in a moment, so faithfully and so minutely, that one may creep over the surface of the picture with his microscope and find every leaf perfect, or read the letters of distant signs, and see what was the play at the "Variétés" or the "Victoria," on the evening of the day when it was taken, just as he would sweep the

real view with a spy-glass to explore all that it contains.

Some years ago, we sent a page or two to one of the magazines,—the "Knickerbocker," if we remember aright,—in which the story was told from the "Arabian Nights," of the three kings' sons, who each wished to obtain the hand of a lovely princess, and received for answer, that he who brought home the most wonderful object should obtain the lady's hand as his reward. Our readers, doubtless, remember the original tale, with the flying carpet, the tube which showed what a distant friend was doing by looking into it, and the apple which gave relief to the most desperate sufferings only by inhalation of its fragrance. The railroad-car, the telegraph, and the apple-flavored chloroform could and do realize, every day,—as was stated in the passage referred to, with a certain rhetorical amplitude not doubtfully suggestive of the lecture-room,—all that was fabled to have been done by the carpet, the tube, and the fruit of the Arabian story.

All these inventions force themselves upon us to the full extent of their significance. It is therefore hardly necessary to waste any considerable amount of rhetoric upon wonders that are so thoroughly appreciated. When human art says to each one of us, I will give you ears that can hear a whisper in New Orleans, and legs that can walk six hundred miles in a day, and if, in consequence of any defect of rail or carriage, you should be so injured that your own very insignificant walking members must be taken off, I can make the surgeon's visit a pleasant dream for you, on awaking from which

you will ask when he is coming to do that which he has done already,—what is the use of poetical or rhetorical amplification? But this other invention of *the mirror with a memory*, and especially that application of it which has given us the wonders of the stereoscope, is not so easily, completely, universally recognized in all the immensity of its applications and suggestions. The stereoscope, and the pictures it gives, are, however, common enough to be in the hands of many of our readers; and as many of those who are not acquainted with it must before long become as familiar with it as they are now with friction-matches, we feel sure that a few pages relating to it will not be unacceptable.

Our readers may like to know the outlines of the process of making daguerreotypes and photographs, as just furnished us by Mr. Whipple, one of the most successful operators in this country. We omit many of those details which are everything to the practical artist, but nothing to the general reader. We must premise, that certain substances undergo chemical alterations, when exposed to the light, which produce a change of color. Some of the compounds of silver possess this faculty to a remarkable degree,—as the common indelible marking-ink, (a solution of nitrate of silver,) which soon darkens in the light, shows us every day. This is only one of the innumerable illustrations of the varied effects of light on color. A living plant owes its brilliant hues to the sunshine; but a dead one, or the tints extracted from it, will fade in the same rays which clothe the tulip in crimson and gold,—as our

lady-readers who have rich curtains in their drawing-rooms know full well. The sun, then, is a master of *chiaroscuro*, and, if he has a living petal for his pallet, is the first of colorists.—Let us walk into his studio, and examine some of his painting machinery.

1. The Daguerreotype.—A silver-plated sheet of copper is resilvered by electro-plating, and perfectly polished. It is then exposed in a glass box to the vapor of iodine until its surface turns to a golden yellow. Then it is exposed in another box to the fumes of the bromide of lime until it becomes of a blood-red tint. Then it is exposed once more, for a few seconds, to the vapor of iodine. The plate is now sensitive to light, and is of course kept from it, until, having been placed in the darkened camera, the screen is withdrawn and the camera picture falls upon it. In strong light, and with the best instruments, *three seconds*' exposure is enough,—but the time varies with circumstances. The plate is now withdrawn and exposed to the vapor of mercury at 212 degrees. Where the daylight was strongest, the sensitive coating of the plate has undergone such a chemical change, that the mercury penetrates readily to the silver, producing a minute white granular deposit upon it, like a very thin fall of snow, drifted by the wind. The strong lights are little heaps of these granules, the middle lights thinner sheets of them; the shades are formed by the dark silver itself, thinly sprinkled only, as the earth shows with a few scattered snow-flakes on its surface. The precise chem-

ical nature of these granules we care less for than their palpable presence, which may be perfectly made out by a microscope magnifying fifty diameters or even less.

The picture thus formed would soon fade under the action of light, in consequence of further changes in the chemical elements of the film of which it consists. Some of these elements are therefore removed by washing it with a solution of hyposulphite of soda, after which it is rinsed with pure water. It is now permanent in the light, but a touch wipes off the picture as it does the bloom from a plum. To fix it, a solution of hyposulphite of soda containing chloride of gold is poured on the plate while this is held over a spirit-lamp. It is then again rinsed with pure water, and is ready for its frame.

2. The Photograph.—Just as we must have a mold before we can make a cast, we must get a *negative* or reversed picture on glass before we can get our positive or natural picture. The first thing, then, is to lay a sensitive coating on a piece of glass,—crown-glass, which has a natural surface, being preferable to plate-glass. *Collodion*, which is a solution of gun-cotton in alcohol and ether, mingled with a solution of iodide and bromide of potassium, is used to form a thin coating over the glass. Before the plate is dry, it is dipped into a solution of nitrate of silver, where it remains from one to three or four minutes. Here, then, we have essentially the same chemical elements that we have seen employed in the daguerreotype,—namely, iodine, bro-

mine, and silver; and by their mutual reactions in the last process we have formed the sensitive iodide and bromide of silver. The glass is now placed, still wet, in the camera, and there remains from three seconds to one or two minutes, according to circumstances. It is then washed with a solution of sulphate of iron. Every light spot in the camera-picture becomes dark on the sensitive coating of the glass-plate. But where the shadows or dark parts of the camera-picture fall, the sensitive coating is less darkened, or not at all, if the shadows are very deep, and so these shadows of the camera-picture become the lights of the glass-picture, as the lights become the shadows. Again, the picture is reversed, just as in every camera-obscura where the image is received on a screen direct from the lens. Thus the glass plate has the right part of the object on the left side of its picture, and the left part on its right side; its light is darkness, and its darkness is light. Everything is just as wrong as it can be, except that the relations of each wrong to the other wrongs are like the relations of the corresponding rights to each other in the original natural image. This is a *negative* picture.

Extremes meet. Every given point of the picture is as far from truth as a lie can be. But in traveling away from the pattern it has gone round a complete circle, and is at once as remote from Nature and as near it as possible.—"How far is it to Taunton?" said a countryman, who was walking exactly the wrong way to reach that commercial and piscatory center.—"'Bäout twen

ty-five thäousan' mild,"—said the boy he asked,—"' fy' go 'z y' 'r' goin' näow, 'n' 'bäout hääf a mild 'f y' turn right räoun' 'n' go t'other way."

The negative picture being formed, it is washed with a solution of hyposulphite of soda, to remove the soluble principles which are liable to decomposition. * *

This *negative* is now to give birth to a *positive*,—this mass of contradictions to assert its hidden truth in a perfect harmonious affirmation of the realities of Nature. Behold the process!

A sheet of the best linen paper is dipped in salt water and suffered to dry. Then a solution of nitrate of silver is poured over it and it is dried in a dark place. This paper is now sensitive; it has a conscience, and is afraid of daylight. Press it against the glass negative and lay them in the sun, the glass uppermost, leaving them so for from three to ten minutes. The paper, having the picture formed on it, is then washed with the solution of hyposulphite of soda, rinsed in pure water, soaked again in a solution of hyposulphite of soda, to which, however, the chloride of gold has been added, and again rinsed. It is then sized or varnished.

Out of the perverse and totally depraved negative,—where it might almost seem as if some magic and diabolic power had wrenched all things from their proprieties, where the light of the eye was darkness, and the deepest blackness was gilded with the brightest glare,—is to come the true end of all this series of operations, a copy of Nature in all her sweet gradations and harmonies and contrasts.

We owe the suggestion to a great wit, who overflowed our small intellectual home-lot with a rushing freshet of fertilizing talk the other day,—one of our friends, who quarries thought on his own premises, but does not care to build his blocks into books and essays,—that perhaps this world is only the *negative* of that better one in which lights will be turned to shadows and shadows into light, but all harmonized, so that we shall see why these ugly patches, these misplaced gleams and blots, were wrought into the temporary arrangements of our planetary life.

For, lo! when the sensitive paper is laid in the sun under the negative glass, every dark spot on the glass arrests a sunbeam, and so the spot of the paper lying beneath remains unchanged; but every light space of the negative lets the sunlight through, and the sensitive paper beneath confesses its weakness, and betrays it by growing dark just in proportion to the glare that strikes upon it. So, too, we have only to turn the glass before laying it on the paper, and we bring all the natural relations of the object delineated back again,—its right to the right of the picture, its left to the picture's left.

On examining the glass negative by transmitted light with a power of a hundred diameters, we observe minute granules, whether crystalline or not we cannot say, very similar to those described in the account of the daguerreotype. But now their effect is reversed. Being opaque, they darken the glass wherever they are accumulated, just as the snow darkens our skylights. Where these particles are drifted, therefore, we have our shad-

ows, and where they are thinly scattered, our lights. On examining the paper photographs, we have found no distinct granules, but diffused stains of deeper or lighter shades.

Such is the sun-picture, in the form in which we now most commonly meet it,—for the daguerreotype, perfect and cheap as it is, and admirably adapted for miniatures, has almost disappeared from the field of landscape, still life, architecture, and *genre* painting, to make room for the photograph. Mr. Whipple tells us that even now he takes a much greater number of miniature portraits on metal than on paper; and yet, except occasionally a statue, it is rare to see anything besides a portrait shown in a daguerreotype. But the greatest number of sun-pictures we see are the photographs which are intended to be looked at with the aid of the instrument we are next to describe, and to the stimulus of which the recent vast extension of photographic copies of Nature and Art is mainly owing.

3. The Stereoscope.—This instrument was invented by Professor Wheatstone, and first described by him in 1838. It was only a year after this that M. Daguerre made known his discovery in Paris; and almost at the same time Mr. Fox Talbot sent his communication to the Royal Society, giving an account of his method of obtaining pictures on paper by the action of light. Iodine was discovered in 1811, bromine in 1826, chloroform in 1831, gun-cotton, from which collodion is made, in 1846, the electro-plating process about the same time

with photography; "all things, great and small, working together to produce what seemed at first as delightful, but as fabulous, as Aladdin's ring, which is now as little suggestive of surprise as our daily bread"

A stereoscope is an instrument which makes surfaces look solid. All pictures in which perspective and light and shade are properly managed, have more or less of the effect of solidity; but by this instrument that effect is so heightened as to produce an appearance of reality which cheats the senses with its seeming truth.

There is good reason to believe that the appreciation of solidity by the eye is purely a matter of education. The famous case of a young man who underwent the operation of couching for cataract, related by Cheselden, and a similar one reported in the Appendix to Müller's Physiology, go to prove that everything is seen only as a superficial extension, until the other senses have taught the eye to recognize *depth*, or the third dimension, which gives solidity, by converging outlines, distribution of light and shade, change of size, and of the texture of surfaces. Cheselden's patient thought "all objects whatever touched his eyes, as what he felt did his skin." The patient whose case is reported by Müller could not tell the form of a cube held obliquely before his eye from that of a flat piece of pasteboard presenting the same outline. Each of these patients saw only with one eye,—the other being destroyed, in one case, and not restored to sight until long after the first, in the other case. In two months' time Cheselden's patient had learned to know solids; in fact,

he argued so logically from light and shade and perspective that he felt of pictures, expecting to find reliefs and depressions, and was surprised to discover that they were flat surfaces. If these patients had suddenly recovered the sight of *both* eyes, they would probably have learned to recognize solids more easily and speedily.

We can commonly tell whether an object is solid, readily enough with one eye, but still better with two eyes, and sometimes *only* by using both. If we look at a square piece of ivory with one eye alone, we cannot tell whether it is a scale of veneer, or the side of a cube, or the base of a pyramid, or the end of a prism. But if we now open the other eye, we shall see one or more of its sides, if it have any, and then know it to be a solid, and what kind of a solid.

We see something with the second eye which we did not see with the first; in other words, the two eyes see different pictures of the same thing, for the obvious reason that they look from points two or three inches apart. By means of these two different views of an object, the mind, as it were, *feels round it* and gets an idea of its solidity. We clasp an object with our eyes, as with our arms, or with our hands, or with our thumb and finger, and then we know it to be something more than a surface. This, of course, is an illustration of the fact, rather than an explanation of its mechanism.

Though, as we have seen, the two eyes look on two different pictures, we perceive but one picture. The two have run together and become blended in a third,

which shows us everything we see in each. But, in order that they should so run together, both the eye and the brain must be in a natural state. Push one eye a little inward with the forefinger, and the image is doubled, or at least confused. Only certain parts of the two retinæ work harmoniously together, and you have disturbed their natural relations. Again, take two or three glasses more than temperance permits, and you see double; the eyes are right enough, probably, but the brain is in trouble, and does not report their telegraphic messages correctly. These exceptions illustrate the every-day truth, that, when we are in right condition, our two eyes see two somewhat different pictures, which our perception combines to form one picture, representing objects in all their dimensions, and not merely as surfaces.

Now, if we can get two artificial pictures of any given object, one as we should see it with the right eye, the other as we should see it with the left eye, and then, looking at the right picture, and that only, with the right eye, and at the left picture, and that only, with the left eye, contrive some way of making these pictures run together as we have seen our two views of a natural object do, we shall get the sense of solidity that natural objects give us. The arrangement which effects it will be a *stereoscope*, according to our definition of that instrument. How shall we attain these two ends?

1. An artist can draw an object as he sees it, looking at it only with his right eye. Then he can draw a second view of the same object as he sees it with his left

eye. It will not be hard to draw a cube or an octahedron in this way; indeed, the first stereoscopic figures were pairs of outlines, right and left, of solid bodies, thus drawn. But the minute details of a portrait, a group, or a landscape, all so nearly alike to the two eyes, yet not identical in each picture of our natural double view, would defy any human skill to reproduce them exactly. And just here comes in the photograph to meet the difficulty. A first picture of an object is taken,—then the instrument is moved a couple of inches or a little more, the distance between the human eyes, and a second picture is taken. Better than this, two pictures are taken at once in a double camera.

We were just now stereographed, ourselves, at a moment's warning, as if we were fugitives from justice. A skeleton shape, of about a man's height, its head covered with a black veil, glided across the floor, faced us, lifted its veil, and took a preliminary look. When we had grown sufficiently rigid in our attitude of studied ease, and got our umbrella into a position of thoughtful carelessness, and put our features with much effort into an unconstrained aspect of cheerfulness tempered with dignity, of manly firmness blended with womanly sensibility, of courtesy, as much as to imply,—"You honor me, Sir," toned or sized, as one may say, with something of the self-assertion of a human soul which reflects proudly, "I am superior to all this,"—when, I say, we were all right, the spectral Mokanna dropped his long veil, and his waiting-slave put a sensitive tablet under its folds. The veil was then again lifted, and the

two great glassy eyes stared at us once more for some thirty seconds. The veil then dropped again; but in the mean time, the shrouded sorcerer had stolen our double image; we were immortal. Posterity might thenceforth inspect us, (if not otherwise engaged,) not as a surface only, but in all our dimensions as an undisputed *solid* man of Boston.

2. We have now obtained the double-eyed or twin pictures, or STEREOGRAPH, if we may coin a name. But the pictures are two, and we want to slide them into each other, so to speak, as in natural vision, that we may see them as one. How shall we make one picture out of two, the corresponding parts of which are separated by a distance of two or three inches?

We can do this in two ways. First, by *squinting* as we look at them. But this is tedious, painful, and to some impossible, or at least very difficult. We shall find it much easier to look through a couple of glasses that *squint for us.* If at the same time they *magnify* the two pictures, we gain just so much in the distinctness of the picture, which, if the figures on the slide are small, is a great advantage. One of the easiest ways of accomplishing this double purpose is to cut a convex lens through the middle, grind the curves of the two halves down to straight lines, and join them by their thin edges. This is a *squinting magnifier*, and if arranged so that with its right half we see the right picture on the slide, and with its left half the left picture, it squints them both inward so that they run together and form a single picture.

Such are the stereoscope and the photograph, by the aid of which *form* is henceforth to make itself seen through the world of intelligence, as thought has long made itself heard by means of the art of printing. The *morphotype*, or form-print, must hereafter take its place by the side of the *logotype* or word-print. The *stereograph*, as we have called the double picture designed for the stereoscope, is to be the card of introduction to make all mankind acquaintances.

The first effect of looking at a good photograph through the stereoscope is a surprise such as no painting ever produced. The mind feels its way into the very depths of the picture. The scraggy branches of a tree in the foreground run out at us as if they would scratch our eyes out. The elbow of a figure stands forth so as to make us almost uncomfortable. Then there is such a frightful amount of detail, that we have the same sense of infinite complexity which Nature gives us. A painter shows us masses; the stereoscopic figure spares us nothing,—all must be there, every stick, straw, scratch, as faithfully as the dome of St. Peter's, or the summit of Mont Blanc, or the ever-moving stillness of Niagara. The sun is no respecter of persons or of things.

This is one infinite charm of the photographic delineation. Theoretically, a perfect photograph is absolutely inexhaustible. In a picture you can find nothing which the artist has not seen before you; but in a perfect photograph there will be as many beauties lurking, unobserved, as there are flowers that blush unseen in

forests and meadows. It is a mistake to suppose one knows a stereoscopic picture when he has studied it a hundred times by the aid of the best of our common instruments. Do we know all that there is in a landscape by looking out at it from our parlor-windows? In one of the glass stereoscopic views of Table Rock, two figures, so minute as to be mere objects of comparison with the surrounding vastness, may be seen standing side by side. Look at the two faces with a strong magnifier, and you could identify their owners, if you met them in a court of law.

Many persons suppose that they are looking on *miniatures* of the objects represented, when they see them in the stereoscope. They will be surprised to be told that they see most objects as large as they appear in Nature. A few simple experiments will show how what we see in ordinary vision is modified in our perceptions by what we think we see. We made a sham stereoscope, the other day, with no glasses, and an opening in the place where the pictures belong, about the size of one of the common stereoscopic pictures. Through this we got a very ample view of the town of Cambridge, including Mount Auburn and the Colleges, in a single field of vision. We do not recognize how minute distant objects really look to us, without something to bring the fact home to our conceptions. A man does not deceive us as to his real size when we see him at the distance of the length of Cambridge Bridge. But hold a common black pin before the eyes at the distance of distinct vision, and one-twentieth of its

length, nearest the point, is enough to cover him so that he can not be seen. The head of the same pin will cover one of the Cambridge horse-cars at the same distance, and conceal the tower of Mount Auburn, as seen from Boston.

We are near enough to an edifice to see it well, when we can easily read an inscription upon it. The stereoscopic views of the arches of Constantine and of Titus give not only every letter of the old inscriptions, but render the grain of the stone itself. On the pediment of the Pantheon may be read, not only the words traced by Agrippa, but a rough inscription above it, scratched or hacked into the stone by some wanton hand during an insurrectionary tumult.

This distinctness of the lesser details of a building or a landscape often gives us incidental truths which interest us more than the central object of the picture. Here is Alloway Kirk, in the church-yard of which you may read a real story by the side of the ruin that tells of more romantic fiction. There stands the stone "Erected by James Russell, seedsman, Ayr, in memory of his children,"—three little boys, James, and Thomas, and John. all snatched away from him in the space of three successive summer-days, and lying under the matted grass in the shadow of the old witch-haunted walls. It was Burns's Alloway Kirk we paid for, and we find we have bought a share in the griefs of James Russell, seedsman; for is not the stone that tells this blinding sorrow of real life the true center of the picture, and not the roofless pile which reminds us of an idle legend?

We have often found these incidental glimpses of life and death running away with us from the main object the picture was meant to delineate. The more evidently accidental their introduction, the more trivial they are in themselves, the more they take hold of the imagination. It is common to find an object in one of the twin pictures which we miss in the other; the person or the vehicle having moved in the interval of taking the two photographs. There is before us a view of the Pool of David at Hebron, in which a shadowy figure appears at the water's edge, in the right-hand farther corner of the right-hand picture only. This muffled shape stealing silently into the solemn scene has already written a hundred biographies in our imagination. In the lovely glass stereograph of the Lake of Brienz, on the left-hand side, a vaguely hinted female figure stands by the margin of the fair water; on the other side of the picture she is not seen. This is life; we seem to see her come and go. All the longings, passions, experiences, possibilities of womanhood animate that gliding shadow which has flitted through our consciousness, nameless, dateless, featureless, yet more profoundly real than the sharpest of portraits traced by a human hand. * * *

Oh, infinite volumes of poems that I treasure in this small library of glass and pasteboard! I creep over the vast features of Rameses, on the face of his rock-hewn Nubian temple; I scale the huge mountain-crystal that calls itself the Pyramid of Cheops. I pace the length of the three Titanic stones of the wall of Baalbec,—

mightiest masses of quarried rock that man has lifted into the air; and then I dive into some mass of foliage with my microscope, and trace the veinings of a leaf so delicately wrought in the painting not made with hands, that I can almost see its down and the green aphis that sucks its juices. I look into the eyes of the caged tiger, and on the scaly train of the crocodile, stretched on the sands of the river that has mirrored a hundred dynasties. I stroll through Rhenish vineyards, I sit under Roman arches, I walk the streets of once buried cities, I look into the chasms of Alpine glaciers, and on the rush of wasteful cataracts. I pass, in a moment, from the banks of the Charles to the ford of the Jordan, and leave my outward frame in the arm-chair at my table, while in spirit I am looking down upon Jerusalem from the Mount of Olives. * * *

The very things which an artist would leave out, or render imperfectly, the photograph takes infinite care with, and so makes its illusions perfect. What is the picture of a drum without the marks on its head where the beating of the sticks has darkened the parchment? In three pictures of the Ann Hathaway Cottage, before us,—the most perfect, perhaps, of all the paper stereographs we have seen,—the door at the farther end of the cottage is open, and we see the marks left by the rubbing of hands and shoulders as the good people came through the entry, or leaned against it, or felt for the latch. It is not impossible that scales from the epidermis of the trembling hand of Ann Hathaway's young suitor, Will Shakespeare, are still adherent about the

old latch and door, and that they contribute to the stains we see in our picture.

Among the accidents of life, as delineated in the stereograph, there is one that rarely fails in any extended view which shows us the details of streets and buildings. There may be neither man nor beast nor vehicle to be seen. You may be looking down on a place in such a way that none of the ordinary marks of its being actually inhabited show themselves. But in the rawest Western settlement and the oldest Eastern city, in the midst of the shanties at Pike's Peak and stretching across the court-yards as you look into them from above the clay-plastered roofs of Damascus, wherever man lives with any of the decencies of civilization, you will find the *clothes-line*. It may be a fence, (in Ireland,)—it may be a tree, (if the Irish license is still allowed us,)—but clothes-drying, or a place to dry clothes on, the stereoscopic photograph insists on finding, wherever it gives us a group of houses. This is the city of Berne. How it brings the people who sleep under that roof before us to see their sheets drying on that fence! and how real it makes the men in that house to look at their shirts hanging, arms down, from yonder line! * * *

What is to come of the stereoscope and the photograph we are almost afraid to guess, lest we should seem extravagant. But, premising that we are to give a *colored* stereoscopic mental view of their prospects, we will venture on a few glimpses at a conceivable, if not a possible future.

Form is henceforth divorced from matter. In fact, matter as a visible object is of no great use any longer, except as the mold on which form is shaped. Give us a few negatives of a thing worth seeing, taken from different points of view, and that is all we want of it. Pull it down or burn it up, if you please. We must, perhaps, sacrifice some luxury in the loss of color; but form and light and shade are the great things, and even color can be added, and perhaps by and by may be got direct from Nature.

There is only one Coliseum or Pantheon; but how many millions of potential negatives have they shed,—representatives of billions of pictures,—since they were erected! Matter in large masses must always be fixed and dear; form is cheap and transportable. We have got the fruit of creation now, and need not trouble ourselves with the core. Every conceivable object of Nature and Art will soon scale off its surface for us. Men will hunt all curious, beautiful, grand objects, as they hunt the cattle in South America, for their *skins*, and leave the carcasses as of little worth.

The consequence of this will soon be such an enormous collection of forms that they will have to be classified and arranged in vast libraries, as books are now. The time will come when a man who wishes to see any object, natural or artificial, will go to the Imperial, National, or City Stereographic Library and call for its skin or form, as he would for a book at any common library. We do now distinctly propose the creation of a comprehensive and systematic stereo-

graphic library, where all men can find the special forms they particularly desire to see as artists, or as scholars, or as mechanics, or in any other capacity.

* * *

Again, we must have special stereographic collections, just as we have professional and other special libraries. And as a means of facilitating the formation of public and private stereographic collections, there must be arranged a comprehensive system of exchanges, so that there may grow up something like a universal currency of these bank-notes, or promises to pay in solid substance, which the sun has engraved for the great Bank of Nature.

To render comparison of similar objects, or of any that we may wish to see side by side, easy, there should be a stereographic *metre* or fixed standard of focal length for the camera lens, to furnish by its multiples or fractions, if necessary, the scale of distances, and the standard of power in the stereoscope lens. In this way the eye can make the most rapid and exact comparisons. If the "great elm" and the Cowthorpe oak, if the State-House and St. Peter's, were taken on the same scale, and looked at with the same magnifying power, we should compare them without the possibility of being misled by those partialities which might tend to make us overrate the indigenous vegetable and the dome of our native Michel Angelo.

The next European war will send us stereographs of battles. It is asserted that a bursting shell can be photographed. The time is perhaps at hand when a flash

of light, as sudden and brief as that of the lightning which shows a whirling wheel standing stock still, shall preserve the very instant of the shock of contact of the mighty armies that are even now gathering. The lightning from heaven does actually photograph natural objects on the bodies of those it has just blasted,—so we are told by many witnesses. The lightning of clashing sabres and bayonets may be forced to stereotype itself in a stillness as complete as that of the tumbling tide of Niagara as we see it self-pictured.

We should be led on too far, if we developed our belief as to the transformations to be wrought by this greatest of human triumphs over earthly conditions, the divorce of form and substance. Let our readers fill out a blank check on the future as they like,—we give our indorsement to their imaginations beforehand. We are looking into stereoscopes as pretty toys, and wondering over the photograph as a charming novelty; but before another generation has passed away, it will be recognized that a new epoch in the history of human progress dates from the time when He who

> —— never but in uncreated light
> Dwelt from eternity—

took a pencil of fire from the hand of the "angel standing in the sun," and placed it in the hands of a mortal.

SUN-PAINTING

AND

SUN-SCULPTURE;

WITH A STEREOSCOPIC TRIP ACROSS THE ATLANTIC

THERE is one old fable which Lord Bacon, in his "Wisdom of the Ancients," has not interpreted. This is the flaying of Marsyas by Apollo. Everybody remembers the accepted version of it, namely,—that the young shepherd found Minerva's flute, and was rash enough to enter into a musical contest with the God of Music. He was vanquished, of course,—and the story is, that the victor fastened him to a tree and flayed him alive.

But the God of Song was also the God of Light, and a moment's reflection reveals the true significance of this seemingly barbarous story. Apollo was pleased with his young rival, fixed him in position against an iron rest, (the *tree* of the fable,) and took a *photograph*, a sun-picture, of him. This thin film or *skin* of light and shade was absurdly interpreted as being the *cutis*, or untanned leather integument of the young shepherd. The human discovery of the art of photography enables us to rectify the error and restore that important article of clothing to the youth, as well as to vindicate the character of Apollo. There is one spot less upon the

sun since the theft from heaven of Prometheus Daguerre and his fellow-adventurers has enabled us to understand the ancient legend.

We are now flaying our friends and submitting to be flayed ourselves, every few years or months or days, by the aid of the trenchant sunbeam which performed the process for Marsyas. All the world has to submit to it,—kings and queens with the rest. The monuments of Art and the face of Nature herself are treated in the same way. We lift an impalpable scale from the surface of the Pyramids. We slip off from the dome of St. Peter's that other imponderable dome which fitted it so closely that it betrays every scratch on the original. We skim off a thin, dry cuticle from the rapids of Niagara, and lay it on our unmoistened paper without breaking a buble or losing a speck of foam. We steal a landscape from its lawful owners, and defy the charge of dishonesty. We skin the flints by the wayside, and nobody accuses us of meanness.

These miracles are being worked all around us so easily and so cheaply that most people have ceased to think of them as marvels. There is a photographer established in every considerable village,—nay, one may not unfrequently see a photographic *ambulance* standing at the wayside upon some vacant lot where it can squat unchallenged in the midst of burdock and plantain and apple-Peru, or making a long halt in the middle of a common by special permission of the "Selectmen."

We must not forget the inestimable preciousness of the new Promethean gifts because they have become

familiar. Think first of the privilege we all possess now of preserving the lineaments and looks of those dear to us.

"Blest be the art which can immortalize,"

said Cowper. But remember how few painted portraits really give their subjects. Recollect those wandering Thugs of Art whose murderous doings with the brush used frequently to involve whole families; who passed from one country tavern to another, eating and painting their way,—feeding a week upon the landlord, another week upon the landlady, and two or three days apiece upon the children; as the walls of those hospitable edifices too frequently testify even to the present day. Then see what faithful memorials of those whom we love and would remember are put into our hands by the new art, with the most trifling expenditure of time and money.

This new art is old enough already to have given us the portraits of infants who are now growing into adolescence. By-and-by it will show every aspect of life in the same individual, from the earliest week to the last year of senility. We are beginning to see what it will reveal. Children grow into beauty and out of it. The first line in the forehead, the first streak in the hair are chronicled without malice, but without extenuation. The footprints of thought, of passion, of purpose are all treasured in these fossilized shadows. Family-traits show themselves in early infancy, die out, and reappear. Flitting moods which have escaped one pencil of sunbeams are caught by another. Each new picture gives

us a new aspect of our friend; we find he had not one face, but many.

It is hardly too much to say, that those whom we love no longer leave us in dying, as they did of old. They remain with us just as they appeared in life; they look down upon us from our walls; they lie upon our tables; they rest upon our bosoms; nay, if we will, we may wear their portraits, like signet-rings, upon our fingers. Our own eyes lose the images pictured on them. Parents sometimes forget the faces of their own children in a separation of a year or two. But the unfading artificial retina which has looked upon them retains their impress, and a fresh sunbeam lays this on the living nerve as if it were radiated from the breathing shape. How these shadows last, and how their originals fade away!

What is true of the faces of our friends is still more true of the places we have seen and loved. No picture produces an impression on the imagination to compare with a photographic transcript of the home of our childhood, or any scene with which we have been long familiar. The very point which the artist omits, in his effort to produce general effect, may be exactly the one that individualizes the place most strongly to our memory. There, for instance, is a photographic view of our own birthplace, and with it of a part of our good old neighbor's dwelling. An artist would hardly have noticed a slender, dry, leafless stalk which traces a faint line, as you may see, along the front of our neighbor's house next the corner. That would be nothing to him,

—but to us it marks the stem of the *honeysuckle-vine*, which we remember, with its pink and white heavy-scented blossoms, as long as we remember the stars in heaven.

To this charm of fidelity in the minutest details the stereoscope adds its astonishing illusion of solidity, and thus completes the effect which so entrances the imagination. Perhaps there is also some half-magnetic effect in the fixing of the eyes on the twin pictures,—something like Mr. Braid's *hypnotism*, of which many of our readers have doubtless heard. At least the shutting out of surrounding objects, and the concentration of the whole attention, which is a consequence of this, produce a dream-like exaltation of the faculties, a kind of clairvoyance, in which we seem to leave the body behind us and sail away into one strange scene after another, like disembodied spirits.

"Ah, yes," some unimaginative reader may say; "but there is no color and no motion in these pictures you think so life-like; and at best they are but petty miniatures of the objects we see in Nature."

But color is, after all, a very secondary quality as compared with form. We like a good crayon portrait better for the most part in black and white than in tints of pink and blue and brown. Mr. Gibson has never succeeded in making the world like his flesh-colored statues. The color of a landscape varies perpetually, with the season, with the hour of the day, with the weather, and as seen by sunlight or moonlight; yet our home stirs us with its old associations, seen in any and every light.

As to motion, though of course it is not present in stereoscopic pictures, except in those toy-contrivances which have been lately introduced, yet it is wonderful to see how nearly the effect of motion is produced by the slight difference of light on the water or on the leaves of trees as seen by the two eyes in the double-picture.

And lastly with respect to size, the illusion is on the part of those who suppose that the eye, unaided, ever sees anything but miniatures of objects. Here is a new experiment to convince those who have not reflected on the subject that the stereoscope shows us objects of their natural size.

We had a stereoscopic view taken by Mr. Soule out of our parlor-window, overlooking the town of Cambridge, with the river and the bridge in the foreground. Now, placing this view in the stereoscope, and looking with the left eye at the right stereographic picture, while the right eye looked at the natural landscape, through the window where the view was taken, it was not difficult so to adjust the photographic and real views that one overlapped the other, and then it was shown that the two almost exactly coincided in all their dimensions.

Another point in which the stereograph differs from every other delineation is in the character of its evidence. A simple photographic picture may be tampered with. A lady's portrait has been known to come out of the finishing-artist's room ten years younger than when it left the camera. But try to mend a stereo-

graph and you will soon find the difference. Your marks and patches float above the picture and never identify themselves with it. We had occasion to put a little cross on the pavement of a double photograph of Canterbury Cathedral,—copying another stereoscopic picture where it was thus marked. By careful management the two crosses were made perfectly to coincide in the field of vision, but the image seemed suspended above the pavement, and did not absolutely designate any one stone, as it would have done, if it had been a part of the original picture. The impossibility of the stereograph's perjuring itself is a curious illustration of the law of evidence. "At the mouth of *two witnesses*, or of three, shall he that is worthy of death be put to death; but at the mouth of one he shall not be put to death." No woman may be declared youthful on the strength of a single photograph; but if the stereoscopic twins say she is young, let her be so acknowledged in the high court of chancery of the God of Love.

Some two or three years since, we called the attention of the readers of this magazine to the subject of the stereoscope and the stereograph. Some of our expressions may have seemed extravagant, as if heated by the interest which a curious novelty might not unnaturally excite. We have not lost any of the enthusiasm and delight which that article must have betrayed. After looking over perhaps a hundred thousand stereographs and making a collection of about a thousand, we should feel the same excitement on receiving a new lot to look

over and select from as in those early days of our experience. To make sure that this early interest has not cooled, let us put on record one or two convictions of the present moment.

First, as to the wonderful nature of the invention. If a strange planet should happen to come within hail, and one of its philosophers were to ask us, as it passed, to hand him the most remarkable material product of human skill, we should offer him, without a moment's hesitation, a stereoscope containing an *instantaneous* double-view of some great thoroughfare. * * *

Secondly, of all artificial contrivances for the gratification of human taste, we seriously question whether any offers so much, on the whole, to the enjoyment of the civilized races as the self-picturing of Art and Nature,—with three exceptions: namely, dress, the most universal, architecture, the most imposing, and music, the most exciting, of factitious sources of pleasure.

No matter whether this be an extravagance or an over-statement; none can dispute that we have a new and wonderful source of pleasure in the sun-picture, and especially in the solid sun-*sculpture* of the stereograph. Yet there is a strange indifference to it, even up to the present moment, among many persons of cultivation and taste. They do not seem to have waked up to the significance of the miracle which the Lord of Light is working for them. The cream of the visible creation has been skimmed off; and the sights which men risk their lives and spend their money and endure sea-sickness to behold,—the views of Nature and Art

which make exiles of entire families for the sake of a look at them, and render "bronchitis" and dyspepsia, followed by leave of absence, endurable dispensations to so many worthy shepherds,—these sights, gathered from Alps, temples, palaces, pyramids, are offered you for a trifle, to carry home with you, that you may look at them at your leisure, by your fireside, with perpetual fair weather, when you are in the mood, without catching cold, without following a *valet-de-place*, in any order of succession,—from a glacier to Vesuvius, from Niagara to Memphis,—as long as you like, and breaking off as suddenly as you like;—and you, native of this incomparably dull planet, have hardly troubled yourself to look at this divine gift, which, if an angel had brought it from some sphere nearer to the central throne, would have been thought worthy of the celestial messenger to whom it was intrusted!

It seemed to us that it might possibly awaken an interest in some of our readers, if we should carry them with us through a brief stereographic trip,—describing, not from places, but from the photographic pictures of them which we have in our own collection. Again, those who have collections may like to compare their own opinions of particular pictures mentioned with those here expressed, and those who are buying stereographs may be glad of some guidance in choosing.

But the reader must remember that this trip gives him only a glimpse of a few scenes selected out of our gallery of a thousand. To visit them all, as tourists visit the realities, and report what we saw, with the

usual explanations and historical illustrations, would make a formidable book of travels.

Before we set out, we must know something of the sights of our own country. At least we must see Niagara. * * * Thomson's "Point View, 28," would be a perfect picture of the Falls in summer, if a lady in the foreground had not moved her shawl while the pictures were taking, or in the interval between taking the two. His winter view, "Terrapin Tower, 37," is perfection itself. Both he and Evans have taken fine views of the rapids, *instantaneous*, catching the spray as it leaped and the clouds overhead. Of Blondin on his rope there are numerous views; standing on one foot, on his head, carrying a man on his back, and one frightful picture, where he hangs by one leg, head downward, over the abyss. The best we have seen is Evans's No. 5, a front view, where every muscle stands out in perfect relief, and the symmetry of the most unimpressible of mortals is finely shown. It literally makes the head swim to fix the eyes on some of these pictures. It is a relief to get away from such fearful sights and look up at the Old Man of the Mountain. There stands the face, without any humanizing help from the hand of an artist. Rather an imbecile old gentleman, one would say, with his mouth open; a face such as one may see hanging about railway-stations, and, what is curious, a New-England style of countenance. Let us flit again, and just take a look at the level sheets of water and broken falls of Trenton,—at

the oblong, almost squared arch of the Natural Bridge, —at the ruins of the Pemberton Mills, still smoking,— and so come to Mr. Barnum's "Historical Series." Clark's Island, with the great rock by which the Pilgrims "rested, according to the commandment," on the first Sunday, or Sabbath, as they loved to call it, which they passed in the harbor of Plymouth, is the most interesting of them all to us. But here are many scenes of historical interest connected with the great names and events of our past. The Washington Elm, at Cambridge, (through the branches of which we saw the first sunset we ever looked upon, from this planet, at least,) is here in all its magnificent drapery of hanging foliage. Mr. Soule has given another beautiful view of it, when stripped of its leaves, equally remarkable for the delicacy of its pendent, hair-like spray.

We should keep the reader half an hour looking through this series, if we did not tear ourselves abruptly away from it. We are bound for Europe, and are to leave *via* New York immediately.

Here we are in the main street of the great city. This is Mr. Anthony's miraculous instantaneous view in Broadway. It is the Oriental story of the petrified city made real to our eyes. The character of it is, perhaps, best shown by the use we make of it in our lectures, to illustrate the physiology of walking. Every foot is caught in its movement with such suddenness that it shows as clearly as if quite still. We are surprised to see, in one figure, how long the stride is,—in another, how much the knee is bent,—in a third, how curiously

the heel strikes the ground before the rest of the foot,—in all, how singularly the body is accommodated to the action of walking. The facts which the brothers Weber, laborious German experimenters and observers, had carefully worked out on the bony frame, are illustrated by the various individuals comprising this moving throng. But what a wonder it is, this snatch at the central life of a mighty city as it rushed by in all its multitudinous complexity of movement! Hundreds of objects in this picture could be identified in a court of law by their owners. There stands Car No. 33 of the Astor House and Twenty-seventh Street Fourth Avenue line. The old woman would miss an apple from that pile which you see glistening on her stand. The young man whose back is to us could swear to the pattern of his shawl. The gentleman between two others will no doubt remember that he had a headache the next morning, after this walk he is taking. Notice the caution with which the man driving the dapple-gray horse in a cart loaded with barrels holds his reins,—wide apart, one in each hand. See the shop-boys with their bundles, the young fellow with a lighted cigar in his hand, as you see by the way he keeps it off from his body, the *gamin* stooping to pick up something in the midst of the moving omnibuses, the stout philosophical carman sitting on his cart-tail, Newman Noggs by the lamp-post at the corner. Nay, look into Car No. 33 and you may see the passengers;—is that a young woman's face turned toward you looking out of the window? * * * What a fearfully suggestive pic-

ture! It is a leaf torn from the book of God's recording angel. What if the sky is one great concave mirror, which reflects the picture of all our doings, and photographs every act on which it looks upon dead and living surfaces, so that to celestial eyes the stones on which we tread are written with our deeds, and the leaves of the forest are but undeveloped negatives where our summers stand self-recorded for transfer into the imperishable record? And what a metaphysical puzzle have we here in this simple-looking paradox! Is motion but a succession of rests? All is still in this picture of universal movement. Take ten thousand instantaneous photographs of the great thoroughfare in a day; every one of them will be as still as the *tableau* in the "Enchanted Beauty." Yet the hurried day's life of Broadway will have been made up of just such stillnesses. Motion is as rigid as marble, if you only take a wink's worth of it at a time.

We are all ready to embark now. Here is the harbor; and there lies the Great Eastern at anchor,—the biggest island that ever got adrift. Stay one moment,—they will ask us about secession and the revolted States,—it may be as well to take a look at Charleston, for an instant, before we go.

These three stereographs were sent us by a lady now residing in Charleston. The Battery, the famous promenade of the Charlestonians, since armed with twenty-four-pounders facing Fort Sumter; the interior of Fort Moultrie, with the guns spiked by Major Ander-

son; and a more extensive view of the same interior, with the flag of the seven stars, (corresponding to the seven deadly sins,)—the free end of it tied to a gun-carriage, as if to prevent the winds of the angry heaven from rending it to tatters. In the distance, to the right, Fort Sumter, looking remote and inaccessible,—the terrible rattle which our foolish little spoiled sister Caroline has insisted on getting into her rash hand. How ghostly, yet how real, it looms up out of the dim atmosphere,—the guns looking over the wall and out through the embrasures,—meant for a foreign foe,—this very day (April 13th) turned in self-defence against the children of those who once fought for liberty at Fort Moultrie! It is a sad thought that there are truths which can be got out of life only by the *destructive analysis* of war. Statesmen deal in *proximate principles*,—unstable compounds; but war reduces facts to their simple elements in its red-hot crucible, with its black flux of carbon and sulphur and nitre. Let us turn our back on this miserable, even though inevitable, fraternal strife, and, closing our eyes for an instant, open them in London.

Here we are at the foot of Charing Cross. You remember, of course, how this fine equestrian statue of Charles I. was condemned to be sold and broken up by the Parliament, but was buried and saved by the brazier who purchased it, and so reappeared after the Restoration. To the left, the familiar words "Morley's Hotel" designate an edifice about half windows, where

the plebeian traveller may sit and contemplate Northumberland House opposite, and the straight-tailed lion of the Percys surmounting the lofty battlement which crowns its broad *facade*. We could describe and criticise the statue as well as if we stood under it, but other travellers have done that. Where are all the people that ought to be seen here? Hardly more than three or four figures are to be made out; the rest were moving, and left no images in this slow, old-fashioned picture,—how unlike the miraculous "instantaneous" Broadway we were looking at a little while ago! But there, on one side, an omnibus has stopped long enough to be caught by the sunbeams. There is a mark on it. Try it with a magnifier.

Charing
+
Strand
633.

Here are the towers of Westminster Abbey. A dead failure, as we well remember them,—miserable modern excrescences, which shame the noble edifice. We will hasten on, and perhaps by-and-by come back and enter the cathedral.

How natural Temple Bar looks, with the loaded coach and the cab going through the central arch, and the blur of the hurrying throng darkening the small lateral ones! A fine old structure,—always reminds a Bostonian of the old arch over which the mysterious *Boston Library* was said still to linger out its existence late into the present century. But where are the spikes on which the rebels' heads used to grin until their jaws

fell off? They must have been ranged along that ledge which forms the chord of the arch surmounting the triple-gated structure. To the left a woman is spreading an awning before a shop;—a man would do it for her here. Ghost of a boy with bundle,—seen with right eye only. Other ghosts of passers or loiterers,—one of a pretty woman, as we fancy at least, by the way she turns her face to us. To the right, fragments of signs, as follow:

22
PAT
CO
BR
PR

What can this be but 229, *Patent Combs and Brushes*, PROUT? At any rate, we were looking after Prout's good old establishment, (229, Strand,) which we remembered was close to Temple Bar, when we discovered these fragments, the rest being cut off by the limits of the picture.

London Bridge! Less imposing than Waterloo Bridge, but a massive pile of masonry, which looks as if its rounded piers would defy the Thames as long as those of the Bridge of Sant' Angelo have stemmed the Tiber. Figures indistinct or invisible, as usual, in the foreground, but farther on a mingled procession of coaches, cabs, carts, and people. See the groups in the recesses over the piers. The parapet is breast-high;—a woman can climb over it, and drop or leap into the dark stream lying in deep shadow under the arches.

Women take this leap often. The angels hear them like the splash of drops of blood out of the heart of our humanity. In the distance, wharves, storehouses, stately edifices, steeples, and rising proudly above them, "like a tall bully," London Monument.

Here we are, close to the Monument. Tall, square base, with reliefs, fluted columns, queer top;—looks like an inverted wineglass with a shaving-brush standing up on it; representative of flame, probably. Below this the square *cage* in which people who have climbed the stairs are standing; seems to be ten or twelve feet high, and is barred or wired over. Women used to jump off from the Monument as well as from London Bridge, before they made the cage safe in this way.

"Holloa!" said a man standing in the square one day, to his companion,—"there's the flag coming down from the Monument!"

"It's no flag," said the other, "it's a woman!"

Sure enough, and so it was.

Nobody can mistake the four pepper-boxes, with the four weathercocks on them, surmounting the corners of a great square castle, a little way from the river's edge. That is the Tower of London. We see it behind the masts of sailing-vessels and the chimneys of steamers, gray and misty in the distance. Let us come nearer to it. Four square towers, crowned by four Oriental-looking domes, not unlike the lower half of an inverted balloon: these towers at the angles of a square building with buttressed and battlemented walls, with two ranges of round-arched windows on the side towards us. But

connected with this building are other towers, round, square, octagon, walls with embrasures, moats, loop-holes, turrets, parapets,—looking as if the beef-eaters really meant to hold out, if a new army of Boulogne should cross over some fine morning. We can't stop to go in and see the lions this morning, for we have come in sight of a great dome, and we cannot take our eyes away from it.

That is St. Paul's, the Boston State-House of London. There is a resemblance in effect, but there is a difference in dimensions,—to the disadvantage of the native edifice, as the reader may see in the plate prefixed to Dr. Bigelow's "Technology." The dome itself looks light and airy compared to St. Peter's or the Duomo of Florence,—not only absolutely, but comparatively. The colonnade on which it rests divides the honors with it. It does not brood over the city, as those two others over their subject towns. Michel Angelo's forehead repeats itself in the dome of St. Peter's. Sir Christopher had doubtless a less ample frontal development; indeed, the towers he added to Westminster Abbey would almost lead us to doubt if he had not a vacancy somewhere in his brain. But the dome of the London "State-House" is very graceful,—so light that it looks as if its lineage had been crossed by a spire. Wait until we have gilded the dome of our Boston St. Paul's before drawing any comparisons.

We have seen the outside of London. What do we care for the Crescent, and the Horseguards, and Nelson's Monument, and the statue of Achilles, and the

new Houses of Parliament? The Abbey, the Tower, the Bridge, Temple Bar, the Monument, St. Paul's: these make up the great features of the London we dream about. Let us go into the Abbey for a few moments. The "dim religious light" is pretty good, after all. We can read every letter on that mural tablet to the memory of "the most illustrious and most benevolent John Paul Howard, Earl of Stafford," "a Lover of his Country, *A Relation to Relations*," (what a eulogy and satire in that expression!) and in many ways virtuous and honorable, as "The Countess Dowager, in Testimony of her great Affection and Respect to her Lord's Memory," has commemorated on his monument. We can see all the folds of the Duchess of Suffolk's dress, and the meshes of the net that confines her hair, as she lies in marble effigy on her sculptured sarcophagus. It looks old to our eyes,—for she was the mother of Lady Jane Grey, and died three hundred years ago,—but see those two little stone heads lying on their stone pillow, just beyond the marble Duchess. They are children of Edward III.,—the Black Prince's baby-brothers. They died five hundred years ago,—but what are centuries in Westminster Abbey? Under this pillared canopy, her head raised on two stone cushions, her fair, still features bordered with the spreading cap we know so well in her portraits, lies Mary of Scotland. These fresh monuments, protected from the wear of the elements, seem to make twenty generations our contemporaries. Look at this husband warding off the dart which the grim, draped skeleton is aiming at the

breast of his fainting wife. Most famous, perhaps, of all the statues in the Abbey is this of Joseph Gascoigne Nightingale and his Lady, by Roubilliac. You need not cross the ocean to see it. It is here, literally to every dimple in the back of the falling hand, and every crinkle of the vermiculated stone-work. What a curious pleasure it is to puzzle out the inscriptions on the monuments in the background!—for the beauty of your photograph is, that you may work out minute details with the microscope, just as you can with the telescope in a distant landscape in Nature. There is a lady, for instance, leaning upon an urn,—suggestive, a little, of Morgiana and the forty thieves. Above is a medallion of one wearing a full periwig. Now for a half-inch lens to make out the specks that seem to be letters. "Erected to the Memory of William Pulteney, Earl of Bath, by his Brother"——That will do,—the inscription operates as a cold bath to enthusiasm. But here is our own personal namesake, the once famous Rear Admiral of the White, whose biography we can find nowhere except in the "Gentleman's Magazine," where he devides the glory of the capture of Quebec with General Wolfe. A handsome young man with hyacinthine locks, his arms bare and one hand resting on a cannon. We remember thinking our namesake's statue one of the most graceful in the Abbey, and have always fallen back on the memory of that and of Dryden's Achates of the "Annus Mirabilis," as trophies of the family.

Enough of these marbles; there is no end to them;

the walls and floor of the great, many-arched, thousand-pillared, sky-lifted cavern are crusted all over with them, like stalactites and stalagmites. The vast temple is alive with the images of the dead. Kings and queens, nobles, statesmen, soldiers, admirals, the great men whose deeds we all know, the great writers whose words are in all our memories, the brave and the beautiful whose fame has shrunk into their epitaphs, are all around us. What is the cry for alms that meets us at the door of the church to the mute petition of these marble beggars, who ask to warm their cold memories for a moment in our living hearts? Look up at the mighty arches overhead, borne up on tall clustered columns,—as if that avenue of Royal Palms we remember in the West India Islands (photograph) had been spirited over seas and turned into stone. Make your obeisance to the august shape of Sir Isaac Newton, reclining like a weary swain in the niche at the side of the gorgeous screen. Pass through Henry VII.'s Chapel, a temple cut like a cameo. Look at the shining oaken stalls of the knights. See the banners overhead. There is no such speaking record of the lapse of time as these banners,—there is one of them beginning to drop to pieces; the long day of a century has decay for its dial-shadow.

We have had a glimpse of London,—let us make an excursion to Stratford-on-Avon.

Here you see the Shakspeare House as it was,—wedged in between, and joined to, the "Swan and Maidenhead" Tavern and a mean and dilapidated brick

building, not much worse than itself, however. The first improvement (as you see in No. 2) was to pull down this brick building. The next (as you see in No. 3) was to take away the sign and the bay-window of the "Swan and Maidenhead" and raise two gables out of its roof, so as to restore something like its ancient aspect. Then a rustic fence was put up and the outside arrangements were completed. The cracked and faded sign projects as we remember it of old. In No. 1 you may read "THE IMMORTAL .HAKES*peare* . . . *Born in This House*" about as well as if you had been at the trouble and expense of going there.

But here is the back of the house. Did little Will use to look out at this window with the bull's-eye panes? Did he use to drink from this old pump, or the well in which it stands? Did his shoulders rub against this angle of the old house, built with rounded bricks? It is a strange picture, and sets us dreaming. Let us go in and up-stairs. In this room he was born. They say so, and we will believe it. Rough walls, rudely boarded floor, wide window with small panes, small bust of him between two cactuses in bloom on window-seat. An old table covered with prints and stereographs, a framed picture, and under it a notice "Copies of this Portrait".....the rest, in fine print, can only be conjectured.

Here is the Church of the Holy Trinity, in which he lies buried. The trees are bare that surround it; see the rooks' nests in their tops. The Avon is hard by, dammed just here, with flood-gates, like a canal. Change

the season, if you like,—here are the trees in leaf, and in their shadow the tombs and graves of the mute, inglorious citizens of Stratford.

Ah, how natural this interior, with its great stained window, its mural monuments, and its slab in the pavement with the awful inscription! That we cannot see here, but there is the tablet with the bust we know so well. But this, after all, is Christ's temple, not Shakspeare's. Here are the worshippers' seats,—mark how the polished wood glistens,—there is the altar, and there the open prayer-book,—you can almost read the service from it. Of the many striking things that Henry Ward Beecher has said, nothing, perhaps, is more impressive than his accounts of his partaking of the communion at that altar in the church where Shakspeare rests. A memory more divine than his overshadowed the place, and he thought of Shakspeare, "as he thought of ten thousand things, without the least disturbance of his devotion," though he was kneeling directly over the poet's dust.

If you will stroll over to Shottery now with me, we can see the Ann Hathaway cottage from four different points, which will leave nothing outside of it to be seen. Better to look at than to live in. A fearful old place, full of small vertebrates that squeak and smaller articulates that bite, if its outward promise can be trusted. A thick thatch covers it like a coarse-haired hide. It is patched together with bricks and timber, and partly crusted with scaling plaster. One window has the diamond panes framed in lead, such as we remember see-

ing of old in one or two ancient dwellings in the town of Cambridge, hard by. In this view a young man is sitting, pensive, on the steps which Master William, too ardent lover, used to climb with hot haste and descend with lingering delay. Young men die, but youth lives. Life goes on in the cottage just as it used to three hundred years ago. On the rail before the door sits the puss of the household, of the fiftieth generation, perhaps, from that "harmless, necessary cat" which purred round the poet's legs as he sat talking love with Ann Hathaway. At the foot of the steps is a huge basin, and over the rail hangs—a dishcloth, drying. In these homely accidents of the very instant, that cut across our romantic ideals with the sharp edge of reality, lies one of the ineffable charms of the sun-picture. It is a little thing that gives life to a scene or a face; portraits are never absolutely alive, because they do not *wink*.

Come, we are full of Shakspeare; let us go up among the hills and see where another poet lived and lies. Here is Rydal Mount, the home of Wordsworth. Two-storied, ivy-clad, hedge-girdled, dropped into a crease among the hills that look down dimly from above, as if they were hunting after it as ancient dames hunt after a dropped thimble. In these walks he used to go "booing about," as his rustic neighbor had it,—reciting his own verses. Here is his grave in Grasmere. A plain slab, with nothing but his name. Next him lies Dora, his daughter, beneath a taller stone bordered with a tracery of ivy, and bearing in relief a lamb and a cross.

Her husband lies next in the range. The three graves have just been shorn of their tall grass,—in this other view you may see them half-hidden by it. A few flowering stems have escaped the scythe in the first picture, and nestle close against the poet's headstone. Hard by sleeps poor Hartley Coleridge, with a slab of freestone graven with a cross and a crown of thorns, and the legend, "By thy Cross and Passion, Good Lord, deliver us."* All around are the graves of those whose names the world has not known. This view, (302,) from above Rydal Mount, is so Claude-like, especially in its trees, that one wants the solemn testimony of the double-picture to believe it an actual transcript of Nature. Of the other English landscapes we have seen, one of the most pleasing on the whole is that marked 43,—Sweden Bridge, near Ambleside. But do not fail to notice St. Mary's Church (101) in the same mountain-village. It grows out of the ground like a crystal, with spur-like gables budding out all the way up its spire, as if they were ready to flower into pinnacles, like such as have sprung up all over the marble multiflora of Milan.

And as we have been looking at a steeple, let us flit away for a moment and pay our reverence at the foot of the tallest spire in England,—that of Salisbury Cathedral. Here we see it from below, looking up,—one of the most striking pictures ever taken. Look well at it;

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* Miss Martineau, who went to his funeral, and may be supposed to describe after a visit to the churchyard, gives the inscription incorrectly. Tourists cannot be trusted; stereographs can.

Chichester has just fallen, and this is a good deal like it,—some have thought raised by the same builder. It has bent somewhat (as you may see in these other views) from the perpendicular; and though it has been strengthened with clamps and framework, it must crash some day or other, for there has been a great giant tugging at it day and night for five hundred years, and it will at last shut up into itself or topple over with a sound and thrill that will make the dead knights and bishops shake on their stone couches, and be remembered all their days by year-old children. This is the first cathedral we ever saw, and none ever so impressed us since. Vast, simple, awful in dimensions and height, just beginning to grow tall at the point where our proudest steeples taper out, it fills the whole soul, pervades the vast landscape over which it reigns, and, like Niagara and the Alps, abolishes that five- or six-foot personality in the beholder which is fostered by keeping company with the little life of the day in its little dwellings. In the Alps your voice is as the piping of a cricket. Under the sheet of Niagara the beating of your heart seems too trivial a movement to take reckoning of. In the buttressed hollow of one of these palæozoic cathedrals you are ashamed of your ribs, and blush for the exiguous pillars of bone on which your breathing structure reposes. Before we leave Salisbury, let us look for a moment into its cloisters. A green courtyard, with a covered gallery on its level, opening upon it through a series of Gothic arches. You may learn more, young American, of the difference between your

civilization and that of the Old World by one look at this than from an average lyceum-lecture an hour long. Seventy years of life means a great deal to you; how little, comparatively, to the dweller in these cloisters! You will have seen a city grow up about you, perhaps; your whole world will have been changed half a dozen times over. What change for him? The cloisters are just as when he entered them,—just as they were a hundred years ago,—just as they will be a hundred years hence.

These old cathedrals are beyond all comparison what are best worth seeing, of man's handiwork, in Europe. How great the delight to be able to bring them, bodily, as it were, to our own firesides! A hundred thousand pilgrims a year used to visit Canterbury. Now Canterbury visits us. See that small white mark on the pavement. That marks the place where the slice of Thomas à Becket's skull fell when Reginald Fitz Urse struck it off with a "Ha!" that seems to echo yet through the vaulted arches. And see the broad stairs, worn by the pilgrims' knees as they climbed to the martyr's shrine. For four hundred years this stream of worshippers was wearing itself into these stones. But there was the place where they knelt before the altar called "Becket's Crown." No! the story that those deep hollows in the marble were made by the pilgrims' knees is too much to believe,—but there are the hollows, and that is the story.

And now, if you would see a perfect gem of the art of photography, and at the same time an unquestioned

monument of antiquity which no person can behold without interest, look upon this,—the monument of the Black Prince There is hardly a better piece of work to be found. His marble effigy lies within a railing, with a sculptured canopy hung over it, like a sounding-board. Above this, on a beam stretched between two pillars, hang the arms he wore at the Battle of Poitiers, —the tabard, the shield, the helmet, the gauntlets, and the sheath that held his sword, which weapon it is said that Cromwell carried off. The outside casing of the shield has broken away, as you observe, but the lions or lizards, or whatever they were meant for, and the flower-de-luces or plumes may still be seen. The metallic scales, if such they were, have partially fallen from the tabard, or frock, and the leather shows bare in parts of it.

Here, hard by, is the sarcophagus of Henry IV. and his queen, also inclosed with a railing like the other. It was opened about thirty years ago, in presence of the dean of the cathedral. There was a doubt, so it was said, as to the monarch's body having been really buried there. Curiosity had nothing to do with it, it is to be presumed. Every over-ground sarcophagus is opened sooner or later, as a matter of course. It was hard work to get it open; it had to be sawed. They found a quantity of *hay*,—fresh herbage, perhaps, when it was laid upon the royal body four hundred years ago,—and a cross of twigs. A silken mask was on the face. They raised it and saw his red beard, his features well preserved, a gap in the front-teeth, which there was prob-

ably no court-dentist to supply,—the same face the citizens looked on four centuries ago

> "In London streets that coronation-day,
> When Bolingbroke rode on roan Barbary";

then they covered it up to take another nap of a few centuries, until another dean has an historical doubt,—at last, perhaps, to be transported by some future Australian Barnum to the Sidney Museum and exhibited as the mummy of one of the English Pharaohs. Look, too, at the "Warriors' Chapel," in the same cathedral. It is a very beautiful stereograph, and may be studied for a long time, for it is full of the most curious monuments.

Before leaving these English churches and monuments, let us enter, if but for a moment, the famous Beauchamp Chapel at Warwick. The finest of the views (323, 324) recalls that of the Black Prince's tomb, as a triumph of photography. Thus, while the whole effect of the picture is brilliant and harmonious, we shall find, on taking a lens, that we can count every individual bead in the chaplet of the monk who is one of the more conspicuous reliefs on the sarcophagus. The figure of this monk itself is about half an inch in height, and its face may be completely hidden by the head of a pin. The whole chapel is a marvel of workmanship and beauty. The monument of Richard Beauchamp in the centre, with the frame of brass over the recumbent figure, intended to support the drapery thrown upon it to protect the statue,—with the mailed shape of the warrior, his feet in long-pointed shoes

resting against the muzzled bear and the griffin, his hands raised, but not joined,—this monument, with the tomb of Dudley, Earl of Leicester,—Elizabeth's Leicester,—and that of the other Dudley, Earl of Warwick,—all enchased in these sculptured walls, and illuminated through that pictured window, where we can dimly see the outlines of saints and holy maidens,—form a group of monumental jewels such as only Henry VII.'s Chapel can equal. For these two pictures (323 and 324) let the poor student pawn his outside-coat, if he cannot have them otherwise.

Of abbeys and castles there is no end. No. 4, Tintern Abbey, is the finest, on the whole, we have ever seen. No. 2 is also very perfect and interesting. In both, the masses of ivy that clothe the ruins are given with wonderful truth and effect. Some of these views have the advantage of being very well colored. Warwick Castle (81) is one of the best and most interesting of the series of castles; Caernarvon is another still more striking.

We may as well break off here as anywhere, so far as England is concerned. England is one great burial-ground to an American. As islands are built up out of the shields of insects, so her soil is made from the bones of her innumerable generations. No one but a travelled American feels what it is to live in a land of monuments. We are all born foundlings, except here and there, in some favored spot, where humanity has nestled for a century or two. Cut flowers of romance and poetry stuck about are poor substitutes for the growths

which have their roots in an old soil that has been changing elements with men and women like ourselves for thousands of years. Perhaps it is well that we should be forced to live mainly for the future; but it is sometimes weary and prosaic.

And yet,—open this enchanted door (of pasteboard) which is the entrance to the land of BURNS, and see what one man can do to idealize and glorify the common life about him! Here is a poor "ten-footer," as we should call it, the cottage William "Burness" built with his own hands, where he carried his young bride Agnes, and where the boy ROBERT, his first-born, was given to the light and air which he made brighter and freer for mankind. Sit still and do not speak,—but see that your eyes do not grow dim as these pictures pass before them: The old hawthorn under which Burns sat with Highland Mary,—a venerable duenna-like tree, with thin arms and sharp elbows, and scanty *chevelure* of leaves; the Auld Brig o' Doon (No. 4),—a daring arch that leaps the sweet stream at a bound, more than half clad in a mantle of ivy, which has crept with its larva-like feet beyond the key-stone; the Twa Brigs of Ayr, with the beautiful reflections in the stream that shines under their eyebrow-arches; and poor little Alloway Kirk, with its fallen roof and high gables. Lift your hand to your eyes and draw a long breath,—for what words would come so near to us as these pictured, nay, real, memories of the dead poet who made a nation of a province, and the hearts of mankind its tributaries?

And so we pass to many-towered and turreted and

pinnacled Abbotsford, and to large-windowed Melrose, and to peaceful Dryburgh, where, under a plain bevelled slab, lies the great Romancer whom Scotland holds only second in her affections to her great poet. Here in the foreground of the Melrose Abbey view (436) is a gravestone which looks as if it might be deciphered with a lens. Let us draw out this inscription from the black archives of oblivion. Here it is:

In Memory of
Francis Cornel, late
Labourer in Greenwell,
Who died 11th July, 1827,
aged 89 years. Also
Margaret Betty, his
Spouse, who died 2d Decr,
1831, aged 89 years.

This is one charm, as we have said over and over, of the truth-telling photograph. We who write in great magazines of course float off from the wreck of our century, on our life-preserving articles, to immortality. What a delight it is to snatch at the unknown head that shows for an instant through the wave, and drag it out to personal recognition and a share in our own sempiternal buoyancy! Go and be photographed on the edge of the Niagara, O unknown aspirant for human remembrance! Do not throw yourself, O traveller, into Etna, like Empedocles, but be taken by the camera standing on the edge of the crater! Who is that lady in the carriage at the door of Burns's cottage? Who is that gentleman in the shiny hat on the sidewalk in front of the

Shakspeare house? Who are those two fair youths lying dead on a heap of dead at the trench's side in the cemetery of Melegnano, in that ghastly glass stereograph in our friend Dr. Bigelow's collection? Some Austrian mother has perhaps seen her boy's features in one of those still faces. All these seemingly accidental figures are not like the shapes put in by artists to fill the blanks in their landscapes, but real breathing persons, or forms that have but lately been breathing, not found there by chance, but brought there with a purpose, fulfilling some real human errand, or at least, as in the last-mentioned picture, waiting to be buried.

Before quitting the British Islands, it would be pleasant to wander through the beautiful Vale of Avoca in Ireland, and to look on those many exquisite landscapes and old ruins and crosses which have been so admirably rendered in the stereograph. There is the Giant's Causeway, too,—not in our own collection, but which our friend Mr. Waterston has transplanted with all its basaltic columns to his Museum of Art in Chester Square. Those we cannot stop to look at now, nor these many objects of historical or poetical interest which lie before us on our own table. Such are the pictures of Croyland Abbey, where they kept that jolly drinking-horn of "Witlaf, King of the Saxons," which Longfellow has made famous; Bedd-Gelert, the grave of the faithful hound immortalized by—nay, who has immortalized—William Spencer; the stone that marks the spot where William Rufus fell by Tyrrel's shaft; the Lion's Head in Dove Dale, fit to be compared with our

own Old Man of the Mountain; the "Bowder Stone," or the great boulder of Borrowdale; and many others over which we love to dream at idle moments.

When we began these notes of travel, we meant to take our fellow-voyagers over the continent of Europe, and perhaps to all the quarters of the globe. We should make a book, instead of an article, if we attempted it. Let us, instead of this, devote the remaining space to an enumeration of a few of the most interesting pictures we have met with, many of which may be easily obtained by those who will take the trouble we have taken to find them. * * *

Almost everything from Italy is interesting. The ruins of Rome, the statues of the Vatican, the great churches, all pass before us, but in a flash, as we are expressed by them on our ideal locomotive. Observe: next to snow and ice, stone is best rendered in the stereograph. Statues are given absolutely well, except where there is much foreshortening to be done, as in this of the Torso, where you see the thigh is unnaturally lengthened. See the mark on the Dying Gladiator's nose. That is where Michel Angelo mended it. There is Hawthorne's Marble Faun, (the one called of Praxiteles,) the Laocoön, the Apollo Belvedere, the Young Athlete with the Strigil, the Forum, the Cloaca Maxima, the Palace of the Cæsars, the bronze Marcus Aurelius,—those wonders all the world flocks to see,—the God of Light has multiplied them all for you, and you have only to give a paltry fee to his servant to own in fee-simple the best sights that earth has to show.

But look in at Pisa one moment, not for the Leaning Tower and the other familiar objects, but for the interior of the Campo Santo, with its holy earth, its innumerable monuments, and the fading frescoes on its walls,—see! there are the Three Kings of Andrea Orgagna. And there hang the broken chains that once, centuries ago, crossed the Arno,—standing off from the wall, so that it seems as if they might clank, if you jarred the stereoscope. Tread with us the streets of Pompeii for a moment: there are the ruts made by the chariots of eighteen hundred years ago,—it is the same thing as stooping down and looking at the pavement itself. And here is the amphitheatre out of which the Pompeians trooped when the ashes began to fall round them from Vesuvius. Behold the famous gates of the Baptistery at Florence,—but do not overlook the exquisite iron gates of the railing outside; think of them as you enter our own Common in Boston from West Street, through those portals which are fit for the gates of—not paradise. Look at this sugar-temple,—no, it is of marble, and is the monument of one of the Scalas at Verona. What a place for ghosts that vast *palazzo* behind it! Shall we stand in Venice on the Bridge of Sighs, and then take this stereoscopic gondola and go through it from St. Mark's to the Arsenal? Not now. We will only look at the Cathedral,—all the pictures under the arches show in our glass stereograph,—at the Bronze Horses, the Campanile, the Rialto, and that glorious old statue of Bartholomew Colleoni,—the very image of what a partisan leader should be, the broad-

shouldered, slender-waisted, stern-featured old soldier who used to leap into his saddle in full armor, and whose men would never follow another leader when he died. Well, but there have been soldiers in Italy since his day. Here are the encampments of Napoleon's army in the recent campaign. This is the battle-field of Magenta with its trampled grass and splintered trees, and the fragments of soldiers' accoutrements lying about.

And here (leaving our own collection for our friend's before-mentioned) here is the great trench in the cemetery of Melegnano, and the heap of dead lying unburied at its edge. Look away, young maiden and tender child, for this is what war leaves after it. Flung together, like sacks of grain, some terribly mutilated, some without mark of injury, all or almost all with a still, calm look on their faces. The two youths, before referred to, lie in the foreground, so simple-looking, so like boys who had been overworked and were lying down to sleep, that one can hardly see the picture for the tears these two fair striplings bring into the eyes.

The Pope must bless us before we leave Italy. See, there he stands on the balcony of St. Peter's, and a vast crowd before him with uncovered heads as he stretches his arms and pronounces his benediction.

Before entering Spain we must look at the Circus of Gavarni, a natural amphitheatre in the Pyrenees. It is the most picturesque of stereographs, and one of the best. As for the Alhambra, we can show that in every aspect; and if you do not vote the lions in the court

of the same a set of mechanical h****gs and nursery bugaboos, we have no skill in entomology. But the Giralda, at Seville, is really a grand tower, worth looking at. The Seville Boston-folks consider it the linchpin, at least, of this rolling universe. And what a fountain this is in the Infanta's garden! what shameful beasts, swine and others, lying about on their stomachs! the whole surmounted by an unclad gentleman squeezing another into the convulsions of a galvanized frog! Queer tastes they have in the Old World. At the Fountain of the Ogre in Berne, the giant, or large-mouthed private person, upon the top of the column, is eating a little infant as one eats a radish, and has plenty more,—a whole bunch of such,—in his hand, or about him.

A voyage down the Rhine shows us nothing better than St. Goar, (No. 2257,) every house on each bank clean and clear as a crystal. The Heidelberg views are admirable;—you see a slight streak in the background of this one: we remember seeing just such a streak from the castle itself, and being told that it was the Rhine, just visible, afar off. The man with the geese in the goose-market at Nuremberg gives stone, iron, and bronze, each in perfection.

So we come to quaint Holland, where we see windmills, *ponts-levis*, canals, galiots, houses with gable-ends to the streets and little mirrors outside the windows, slanted so as to show the frows inside what is going on.

We must give up the cathedrals, after all: Santa Maria del Fiore, with Brunelleschi's dome, which Michel Angelo wouldn't copy and couldn't beat; Milan, aflame

with statues, like a thousand-tapered candelabrum; Tours, with its embroidered portal, so like the lace of an archbishop's robe; even Notre Dame of Paris, with its new spire; Rouen, Amiens, Chartres,—we must give them all up.

Here we are at Athens, looking at the buttressed Acropolis and the ruined temples,—the Doric Parthenon, the Ionic Erechtheum, the Corinthian temple of Jupiter, and the beautiful Caryatides. But see those steps cut in the natural rock. Up those steps walked the Apostle Paul, and from that summit, Mars Hill, the Areopagus, he began his noble address, "Ye men of Athens!"

The Great Pyramid and the Sphinx! Herodotus saw them a little fresher, but of unknown antiquity,—far more unknown to him than to us. The Colossi of the Plain! Mighty monuments of an ancient and proud civilization standing alone in a desert now.

> My name is Osymandyas, King of Kings;
> Look on my works, ye mighty, and despair!

But nothing equals these vast serene faces of the Pharaohs on the great rock-temple of Abou Simbel (Ipsambul) (No. 1, F. 307). It is the sublimest of stereographs, as the temple of Kardasay, this loveliest of views on glass, is the most poetical. But here is the crocodile lying in wait for us on the sandy bank of the Nile, and we must leave Egypt for Syria.

Damascus makes but a poor show, with its squalid houses, and glaring clayed roofs. We always wanted to invest in real estate there in Abraham Street or Noah

Place, or some of its well-established thoroughfares, but are discouraged since we have had these views of the old town. Baalbec does better. See the great stones built into the wall there,—the biggest 64 x 13 x 13! What do you think of that?—a single stone bigger than both your parlors thrown into one, and this one of three almost alike, built into a wall as if just because they happened to be lying round, handy! So, then, we pass on to Bethlehem, looking like a fortress more than a town, all stone and very little window,—to Nazareth, with its brick oven-like houses, its tall minaret, its cypresses, and the black-mouthed, open tombs, with masses of cactus growing at their edge,—to Jerusalem,—to the Jordan, every drop of whose waters seems to carry a baptismal blessing,—to the Dead Sea,—and to the Cedars of Lebanon. Almost everything may have changed in these hallowed places, except the face of the stream and the lake, and the outlines of hill and valley. But as we look across the city to the Mount of Olives, we know that these lines which run in graceful curves along the horizon are the same that He looked upon as He turned his eyes sadly over Jerusalem. We know that these long declivities, beyond Nazareth, were pictured in the eyes of Mary's growing boy just as they are now in ours sitting here by our own firesides.

This is no *toy*, which thus carries us into the very presence of all that is most inspiring to the soul in the scenes which the world's heroes and martyrs, and more than heroes, more than martyrs, have hallowed and

solemnized by looking upon. It is no toy: it is a divine gift, placed in our hands nominally by science, really by that inspiration which is revealing the Almighty through the lips of the humble students of Nature. Look through it once more before laying it down, but not at any earthly sight. In these views, taken through the telescopes of De la Rue of London and of Mr. Rutherford of New York, and that of the Cambridge Observatory by Mr. Whipple of Boston, we see the "spotty globe" of the moon with all its mountains and chasms, its mysterious craters and groove-like valleys. This magnificent stereograph by Mr. Whipple was taken, the first picture February 7th, the second April 6th. In this way the change of position gives the solid effect of the ordinary stereoscopic views, and the sphere rounds itself out so perfectly to the eye that it seems as if we could grasp it like an orange. * * *

We write principally to wake up an interest in a new and inexhaustible source of pleasure, and only regret that the many pages we have filled can do no more than hint the infinite resources which the new art has laid open to us all.

HAVING recognized for some time the important place that stereoscopic photographs must eventually hold, as a means of education, we have been sparing no expense nor effort in making such series of stereoscopic photographs as would bring a person face to face, in a systematic and comprehensive way, with the life, natural conditions and historical remains of the most important countries.

This is a work that has never been attempted before. The plan we have followed, as well as the success that has attended our efforts, is thus stated by a reviewer of our series on Palestine and Egypt:

"The views are not only of remarkable excellence as specimens of photography, but the scenes selected are such as to give an adequate representation not only of the scenery and architectural monuments of these countries, but also of the daily life of the people in the streets, bazaars, fields, and even in their homes and sanctuaries. They are so arranged as to furnish in the case of each country a complete and connected tour, and the office of a guide is fulfilled by an accompanying volume in which every scene presented is described, and its literary and historical importance interestingly set forth."

Our experienced artists in stereoscopic photography have also been through taly, Greece, Russia, Austria, Switzerland, Japan, Cuba, Porto Rico, the Philippines, etc. In fact they have stereographed most of the important countries of the world.

Scores of authorities might be quoted here testifying to the absolute accuracy, the remarkable character, and the importance of these series. Men who have bought a large number of them

say that no private, public, or school library is complete without them.

Think a moment about the significance of the following statements :

" By the use of the stereoscope these scenes are made living realities to an extent that is positively startling to one who has traveled through the East."—Frank K. Sanders, Ph.D., Yale University.

" They are a marvel of realism ; they have taken me back to the Nile and brought again under my eyes the very scenes I witnessed there as vividly as when I watched them on the spot."—J. Irving Manatt, Ph.D., LL.D., Brown University.

" They are the best substitute for an actual visit to those lands that I have ever seen."—Archibald McCullagh, D.D., Worcester, Mass.

" I have seen nothing so realistic since my visit to the Orient."—C. R. Blackall, D.D., Editor of Periodicals, Baptist Publication Society.

" They are far superior to the old stereoscopic views that were so abundant a generation ago. And it (the stereoscope) gives not only pictures, but reproductions of real scenes, real buildings, and real people, with perspective effect of reality that no ordinary photographs can bestow."—Jesse L. Hurlbut, D.D., Editor Sunday-school Literature for the Methodist Episcopal Church.

" It gives me pleasure to declare that your stereoscopic views of Italy and the Holy Land are the best I have ever seen."—Archbishop Ryan, of Philadelphia.

" The next best thing to visiting them (Rome, Jerusalem, etc.) is to have them brought before the eye by very perfect stereoscopic views."—Dr. Theo. L. Cuyler.

" They afford the only means by which the many who can not travel may gain a real acquaintance with other lands and peoples."—William Elder, A.M., Sc.D., Colby University.

After examining our stereoscopic views of Switzerland, Dr. C. H. Parkhurst wrote : " I have seen no photographs that are their equal."

" I have found these views . . . . in particular to possess an educational value of great importance to scholars, students, artists, professional men, and indeed to the general public."—John Clark Ridpath, LL.D., New York.

Still no commendations, nor any amount of detailed description, would give an adequate conception of a series of stereographs. One must put his head in the hood of a stereoscope and *see* before him these scientifically accurate reproductions of real people, real buildings, and real places. It would be as impossible to make one see these reproductions by means of words as to make one see the actual scenes.

But it is a fact also that most people who have looked at stereographs do not realize what they are. People generally have failed to recognize the all-important and fundamental difference between stereoscopic photographs and all other photographs or pictures. Original stereoscopic photographs are not only *original photographs*, made from *original negatives*, in the ordinary use of these terms—they are vastly more. It should be definitely understood that stereographs of landscapes or any objects become, when seen through the stereoscope, *life-size* representations of those landscapes or objects; they are no longer flat surfaces; they have become spaces of three dimensions, in which everything stands out as in nature. As a help to the realization of this startling statement, it should be said that when you put your head in the hood of the stereoscope you have nothing whatever to do with the two photographic prints, three by four inches in size, and six inches in front of your eyes, other than as two windows *through* which you look at the scene *beyond*. If you should look through a window

only a few inches in size, you would not think that the large expanse of landscape before you must be in miniature because the window was small. These may seem like simple statements, but they must not be ignored. They are based on scientific facts which can be found explained in any reliable treatise on binocular vision, such as Prof. Le Conte's "Sight." Dr. Holmes puts the case neatly and accurately when he says that in stereographs we get "sun-sculpture,"—in all other photographs merely "sun-painting."

And, strange as it may seem, this "life-likeness," this marvelous perfection in three dimensions, of stereoscopic representations has had the effect of making the world think of them as a novelty, as a means of amusement and entertainment only. But few, even of those who have seemed to recognize the great and essential difference between stereoscopic photographs and all other kinds of illustrations, have ever woke up to the significance of this difference,—to the greater value and possibilities of usefulness thus possessed by the stereoscopic principle. We can do no more than refer to the subject here, for it is not a small matter to outline the question "in all the immensity of its applications and suggestions."

But we do want to say that if stereographs are to serve useful ends they must not be simply glanced at for the purpose of satisfying curiosity —they must be studied in a serious and intelligent way. This implies at least two things:

First, a realization that nothing but facts—*absolute facts*—as to places and people are given through the stereoscope; and, secondly, that the imagination be aroused while we are looking at these facts. We do not mean now that the imagination is to be made use of for the purpose of forming any fanciful ideas, but simply for the purpose of breathing the breath of life into the representations and thus making us *feel* as though we were in the presence of the actual places or people.

It is not at all impracticable to say that stereoscopic views may thus be to us what the actual scene would be, though it might seem so at first. Many practical men might be quoted to emphasize this important truth, but we will give the statement of only one. The Hon. John L. Bates, Speaker of the House, Commonwealth of Massachusetts, writes, under the date of March 15, 1899:

"In looking over your stereoscopic photographs it seems to me that they give absolutely final facts. *They are so realistic and natural that one feels as if he is beholding the actual scenery; so realistic is the scene made that he obtains the inspiration which actual sight gives.*"

One trouble is that most people think they are using stereoscopic views thus seriously when they are not. How many carelessly exclaim, as they look at some important place through the stereoscope, "Yes, yes! this is just like being there!" etc., when it is nothing like being there to them. If they could turn around in their chairs and look at the actual place, they would look with an entirely

different spirit, such as would stir their whole being. But if these people would use stereographs in the right way; if they would put their head in the stereoscope, forget their surroundings, lose themselves in the study of the facts, the numberless details of the marvelously reproduced scene before them, *then* the stereoscopic representation would become to them, as Speaker Bates says, what the actual scene would be. Dr. Holmes gives the strongest evidence in proof of this. To him also, looking at a stereograph was, for the time being, like looking at the actual place. One who reads thoughtfully his preceding articles will see how much more is received by a person who *does* look at a stereograph in this way, than is received by a person who *thinks* he is so looking. But most people must make considerable effort before they can thus get away from their immediate surroundings while looking at a stereoscopic view, and *feel* as they would if looking at the scene that is reproduced. This is an end worth striving many times to attain. It makes a great difference what mood we are in; we can often get more out of a book or painting one day than we can the next.

It will always be found that the more a series of stereoscopic photographs of a country is studied the more valuable it becomes to its possessor. After a time, if not at first, the stereographed places will become as familiar and real to us in our thoughts as are the places which we have actually visited. And people who come to

look at stereographs in this way, having in mind their true character, will not toss them aside after one or two casual examinations, as though they had gained all that was to be gained from them

Dr. Holmes' articles will serve as an excellent text-book to show by direction, suggestion and example the way to use sterescopic photographs. Instead of doubting, or accepting with meaningless assent, the facts presented by stereographs, Dr. Holmes seized upon them as being as absolutely reliable as those gained by his own eyes. Instead of relegating stereographs to the garret or the nursery, he realized that they were "magical" means in their power to give exactly what one gets with his own eyes in traveling; that is, not alone accurate ideas of places and people, but the intellectual stimulus, expansion, growth, and the wider charity, which comes from being in the presence of such places and people. Instead of thinking that he could gain by one or two careless examinations all that it would be worth while for a man to try to gain from a stereograph, Dr. Holmes not only tried by *careful study* to get all the facts that may be gotten from a picture (he said it was a mistake to suppose one knows a stereoscopic scene when he has studied it a hundred times), but he endeavored, by approaching a stereoscopic representation in an appropriate mood, away from distracting surroundings, with his whole attention concentrated by noting details, to get his imagination into such a state of

healthy activity, that representations became realities indeed—a real mountain rose before him, and he was in the very presence of it; a man in Eastern dress and darkened skin stands with him by the Nile for a few moments, and ever after that man and all his fellows are better known and understood.

Since the imagination has so important a part to perform in making us realize and keep in touch with things that exist or events that occur outside of our immediate surroundings, we turn aside to make quotations in regard to it. Ruskin says: "We think it a great triumph to get our packages and our bodies carried at a fast pace, but we never take the slightest trouble to put any pace in our perceptions. We usually stay at home in thought, or, if we ever mentally see the world, it is at the old stage-coach or wagon rate."

Prof. Charles Elliot Norton, of Harvard University, writing of "the highest end of the highest education," that is, the spirit with which a student is inspired, says: "To secure this end, one means above all is requisite, which, strangely enough, has been greatly neglected in our schemes of education, namely: the culture of the faculties of imagination. The studies that nourish the soul, that afford permanent resources of delight and recreation, that maintain ideals of conduct and develop the sympathies upon which the progress and welfare of society depend, are the studies which quicken and nourish the imagination and are vivified by it."

If we use stereoscopic views as Dr. Holmes did, we shall certainly find them particularly fitted as a means of nourishing and quickening the imagination. And, at the same time, however much our imaginative faculty may be developed, we shall find that they are the means that make it easiest—indeed the only means that will make it possible—for us to see and feel at home what we would see and feel in traveling. The importance of the very form of the stereoscope is shown here,—the fact that it does individualize, that only one can look at a time; that the head must be in the hood of the stereoscope. If a person can ever forget his immediate surroundings and go in imagination to a place, he can do so in this way.

And, as a final suggestion regarding the way to use stereographs, we must remember that people have been looking over too many views at one sitting—running over them too rapidly. As we have seen, the benefit to be derived depends not upon the number looked at, but rather upon the care with which each one is studied. People gallop over stereographs, when they ought to creep. To emphasize still further this important point, we quote from a letter received from Rev. Charles R. Gillett, of Union Theological Seminary:

"Your collection of Egyptian views is a source of constant pleasure and delight. Each one of them is a subject for study and profit. Their detail and lifelikeness are simply marvelous; the figures stand out from the background, as in Nature, and in a way not obtained in an ordinary photograph. In fact, one can scarcely do

justice to a half-dozen views in one evening. To study the series attentively and exhaustively is to make a fireside itinerary of the land of the Nile."

Finally, one should be careful as to whose stereographs he buys. So many stereographs, copies of other pictures or poor photographs of trifling subjects, have been pushed out by unreliable firms, that people have generally come to think of stereoscopic views as the least satisfactory of photographs. On the contrary, leading artists affirm that photography creates nothing more beautiful or serviceable than a stereoscopic picture.

With Underwood & Underwood stereoscopic photography has come to be a profession by itself. Very few people who admire one of our series of a country realize how much skill and experience have been required to produce it. The photography itself, artistic effects shown in a hundred ways, the presence of life, grouping, foreground, judgment in knowing what to take as well as what not to take, etc.—there are such possibilities in all these endless details, that it is entirely impossible for amateurs or firms of little experience or means to offer any number of subjects of a country which are of a high order throughout.

To this work, our firm is able to bring the knowledge and skill acquired by long and successful experience in the stereoscopic view business. Our stereographs are sold the world over, and we can furnish testimonials from such authorities as must assure any one of the excellence and

absolute trustworthiness of our entire series of stereographs.

"One cannot afford to forego the keen enjoyment which an examination of these photographs yields."

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